

Appendix

Design Brief Template Sample: Part 1

School: Orchard Park School

State: California

Division: **Middle School** High School

Team Members: Bethany Fumar, Bella Rose, Natalia Cortez, Yaretzi Costilla –Gutierrez,

Project Title: Readers should have a glimpse at what the project is about and want to read more. (25 word maximum)

Therm-Alert is a device that helps underserved field and construction workers detect any possible heat stroke symptoms.

Project Purpose: In one or two sentences explain what this project intends to do. (50 word maximum)

Therm-Alert's solution to help outside workers is to alert them of any possible heat-stroke symptom. Therm-Alert notifies the worker and a loved one of the user's surface body temperature and heart rate during work. Thus, the user and or a loved can help the workers tend to the heat-stroke symptoms.

Abstract: Briefly describe the people who will benefit from the project and the challenges they face. Include any inequity that the project hopes to address. (100 Words Maximum)

The demographic who benefits from Therm-Alert are field and construction workers. These workers labor in very harsh working conditions which involve high temperatures and lack of shade. With climate change in the mix, this creates a breeding ground for heat-strokes. Heat-strokes can be fatal and create an enormous negative impact on a person's health. They usually require hospitalization and since most migrant field workers have limited access to health care, the costs are very high financially. Therm-Alert hopes to lessen the health gap for these workers by ensuring an affordable device that will help them combat the threat of heat-stroke.

User Research: Discuss key information about the users gathered through your research, interviews, and ongoing discussion with the user throughout the project. What did you learn about the user and the barriers they face? (200 word maximum)

For this project, our team interviewed Victor Moreno (field worker), and Efren Costilla (construction worker). They work in California and are related to our teammates. We have also interviewed various people for feedback through surveys to gain a larger field of opinion. Our ongoing conversations have shaped Therm-Alert tremendously on a very personal level. The information we gathered to design Therm-Alert has been taken from our users' experiences and the CRB, a government-funded organization. California, Therm-Alert's state, leads the nation in field-worker population with over 45% currently employed in the state. Most field workers are predominantly from Latin America and make-up 92% of the workforce. A large majority of these people are also undocumented which makes them more susceptible to unjust work conditions for fear of retaliation from their employer for simply voicing their needs. Approximately 73% of field workers make 200% under the government poverty line, so purchasing a private healthcare plan is simply out of the question. Only 35% get healthcare through public benefits or an employer, the vast majority do not. This leaves the user at a much higher risk of fatality through heat stroke in comparison to an individual who has health care and is documented.

User Insight: Discuss your team's understanding of the experiences, emotions, and motivations of the users. This insight should inform the rest of the project and help the reader have a deeper understanding of the inequity of the user. What did you learn about how the barriers affect the user? (200 word maximum)

Through the various interviews with our users, we gained an incredible amount of knowledge of the rough lifestyle they live through. Victor and Efren have worked in unthinkable working conditions and the only reason they push through it all is for their family. Efren Costilla's emotional telling of his experience of actually going through a heat-stroke really was Therm-Alert's inspiration. Both of our user's emotions were in an endless cycle of foreboding, but Therm-Alert poked a hole and let some light come in through the vicious cycle of uncertainty. But it wasn't only a sigh of relief for their health but also for their family. As previously stated, the only reason they go through these hardships is for their families; our users can't even bear to contemplate the thought of leaving their children without a father or steady income. The hopes of our users' really is an essential part of Therm-Alert; without the ability to empathize or listen, the device made from their experiences would not be the same.

User Needs: Develop a specific list of the user's needs produced from the user insight. What does the user want to help them with the barrier? (100 word maximum)

Efren and Victor need three things: first of all, they need Therm-Alert to be lightweight so it doesn't obstruct them while working. Next, they need an alert so they can be aware when symptoms of a heat-stroke are imminent. As Efren noted, many people do not pay attention to their body while working. Without an alert system, many of our users would forget they were even wearing Therm-Alert. Getting help for our users is important too. We added an app that notifies an employer or family member of the users' health. Therm-Alert has taken all these considerations very seriously.

Project Goals: List project goals and describe how they are linked to and will adequately meet the user's needs and address inequities and/or barriers faced by the user. What do you want the project to do to help the user? (100 word maximum)

Our goal is to reduce the risk of heat-stroke for our user. Therm-Alert does this by having an affordable device that is easily accessible and user-friendly, it detects heat-stroke in its early phases so the need for hospitalizations will go down tremendously, thus, the headache of medical bills will not occur. The ultimate goal is where our user no longer has to worry about choosing between health or employment.

Key Features of Design: List key features, illustrating that the design will adequately meet project goals. How will the project help the user? (200 word maximum)

There are six key features in Therm-Alert. The first two components are a temperature and heart-rate sensor. The third feature is a LCD screen; this screen receives the temperature and heart-rate of the user from the inputs and displays it at all times. The fourth and fifth elements of Therm-Alert are the LEDs and buzzer. There is a green, yellow, and red LED alongside a single buzzer. The green LED stays on when the temperature and heart-rate is at a non-threatening level (below 100F). If the inputs feel a spike in vitals the yellow light will turn on and the buzzer will make a low pitched sound and vibrate (105F). If the temperature and heart-rate are at a threatening level the red light will turn on and the buzzer will make a higher pitched noise than before it will vibrate as well (110F). All the temperature and heart-rate levels the outputs turn on at are completely customizable. Finally, our last main system in Therm-Alert is the outside notifier. When our user reaches a risky level, a notification will be sent to a chosen receiver, therefore our user can receive the care they need in order to combat the heat-stroke.

Impact: Discuss how design addresses inequities for the user and/or removes barriers. Input from users should be included. Does the project help the user? How? (200 word maximum)

Our design addresses the difficulties field-workers and construction workers face. Therm-Alert acts as a personal device that helps the user keep track of their health. Using Therm-Alert would cut the need for hospitalization for Victor and Efren significantly. This is due to the fact that they would be able to detect early symptoms of heat-stroke and then take the necessary steps to avoid it. Since migrant field-workers lack access to healthcare, this would help them tremendously. Therm-Alert truly does help our users. As Efren said, "Having this product can really help my coworkers and I keep our health in check."

Status of Project: Describe the current status of the project, including feedback from users, and discuss potential next steps. What does the project do now? What would you like to work on in the future? (200 word maximum)

At this time, the fourth phase of our project is complete and we are now adding the final touches. We are conducting additional surveys and testing other iterations for the future. The main one would be implementing a MQTT cloud database for our product, as well as a moisture acidity sensor to gain a better reading of a person's vitals for any possible signs of heat-stroke. Alongside this we are actively searching for better materials for the arm-band and testing how to make Therm-Alert more durable than before.

Reflection: Show that the team has an increased understanding of human-centered design. Examples of personal growth and insights gained about designing for others and helping them overcome challenges should also be included. What did you learn during this project? (200 word maximum)

Through this first stretch of the competition, our teammates have gained an incredible amount of knowledge in just a short couple of months. Our eyes opened on the struggles our family members with-stood in order to have food on the table for us. Our team also found a growing passion for circuitry and the coding that it entails, and through it all we found an appreciation for teamwork, and we all forged new friendships. Through the ups and downs of our trajectory we have all learned things that needed to be found, and passions that needed to be discovered, and we couldn't be happier.

Prototype Graphic: A single graphic with key features adequately labeled. It should be easy to understand and the reader should have a general understanding of how the prototype functions by looking at the graphic.

